

# THE FORESTER.

An Illustrated Journal Devoted to Forestry

Issued Six Times a Year.

Each Number Contains Sixteen Pages of Reading Matter.

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An Illustrated Journal Devoted to Forestry.

Official Organ of the New Jersey Forestry Association. Issued six times a year. Each issue contains sixteen pages of short articles pertaining to Arboriculture, Sylviculture, the Preservation of Useful Birds, the Destruction of Harmful Insects, the Establishment of Parks and Reservations, Water Supply, Forest Legislation, Forest Influences, Forest Products, etc., etc.

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Edited by JOHN GIFFORD, Mays Landing, N. J.

In spite of nearness to large population centres and the losses by fire the price of cordwood in South Jersey continues to decrease. If the wood is located more than five miles from a railroad or river, even if of good quality, there is practically no profit in it. An ordinary chopper is lucky if he can earn seventy-five cents a day on an average. If pine wood is slightly charred it is difficult to get rid of it at any price. Thousands of cords in consequence are allowed to rot in the woods. A few years ago it was in demand for charcoal. Ordinary wood at that time was worth one dollar a cord standing. It costs from sixty to seventy-five cents a cord to cut it and if more than five miles from a station \$1.50 a cord to cart it. Large quantities of good wood are selling at \$2.25 delivered on the cars. Besides it is necessary to let it stand for sometime to dry. It is paying no interest in the meantime and is in danger of destruction by fire. On the other hand the saw mills are working even small sized timber with profit, while

cedar logs three inches in diameter are being sawed into laths, and six-inch stuff into shingles and weatherboards.

The writer believes that this condition of affairs is mainly due to fires and to impatience on the part of the woodland owner, who is anxious to get a little something out of it just as soon as possible. Many are content with wages for their teams. By leaving a pine woods grow just a few years longer instead of cutting it for cordwood, provided it escapes fire, even if slightly charred, it would yield a fair profit.

The frontispiece of this issue is a picture of the famous tree of Noche Triste in Southern Mexico. It is a Mexican cypress (*Cupressus Mexicana*). Many claim that this is the oldest tree on the face of the earth. Its age has been estimated by several travelers and their estimates vary from one to six thousand years. It is called the Tree of the Noche Triste or the Tree of the Sorrowful Night because, it is said, Cortez sat on a stone in its shade and wept when his army was pursued by the enraged Indians.

The addition of 75,000 acres to the Adirondack Park is a cause for satisfaction. The lands purchased from Dr. Webb make the largest single block yet acquired in furtherance of the purpose of extending the park to include the 2,807,760 acres fixed upon as a proper preserve for the maintenance of the forest and streams so necessary to the State. With this addition the public domain will amount to 675,000 acres. The State can well afford to spend money in this way.—*New York Tribune.*



## Tree Names.

BY PROF. FERRIS W. PRICE.

The attempt has often been made to explain the origin and significance of plant names, and to indicate their proper pronunciation. These were marked features of Loudon's *Encyclopedia of Plants*, and have been adopted in most of our manuals. However, this information has never, so far as the present writer knows, been put into complete and condensed form. It is mostly scattered, and not always to be relied on. Further, little attention is given to the significance of specific names and to the origin of common names.

The compilation of such a work would be laborious, and is not likely to be attempted soon by any one really qualified for the task.

In the meantime, it is proposed to meet this need, in a limited way, and so far as the names of trees are concerned, by a series of articles to appear in the "Forester." The writer claims no originality or authority; but will conscientiously present the facts within his reach. In general, the geographical range will be the same as in Gray's Manual, Sixth Edition, Revision of Watson & Coulter.

The purpose is, where possible, to afford information in the following directions,—accent, pronunciation, derivation, meaning. Any other facts of interest will be presented after these essentials. Uncertainty will be indicated by the note of interrogation.

## ACCENT AND QUANTITY MARKS.

The *Latin* rules of accent will be followed in all cases.

A *grave* accent ( ` ) indicates that the vowel of the syllable in question should have the regular *long* sound; an *acute* accent ( ´ ) indicates that the vowel should have the regular *short* sound.

In the case of *unaccented* syllables, vowels marked — should have the regular *long* sounds: *ā*, as in *ape*; *ē*, as in *me*; *ō*, as in *no*; *ī*, as in *ice*; *ū*, as in *union*. Vowels marked ~ have the regular *short* sounds: *ă*, as in *at*; *ĕ*, as in *met*; *ĭ*, as in *pin*; *ĕ*, as in *not*; *ŭ*, as in *but*. Vowels without quantity mark or accent should be given the obscure sounds: *a*, as in *idea*; *e*, as in *stamens*; *i*, as in *family*; *o*, as in *person*; *u*, as in *genus*. Obscure *i* before a vowel is sounded like a quickly pronounced *ē*. The sounds of *y* are precisely the same as those of *i*.

The diphthongs *æ* and *œ* have the sound *ē*. *c*

and *g* are *soft*,—that is, have the sounds *s* and *j* respectively,—before *e*, *i*, or *y*; elsewhere, they have the usual *hard* sounds.

## ABBREVIATIONS.

Cent. Dict., Century Dictionary.

Fr., French.

G., Gray's Manual.

Germ., German.

Gr., Greek.

Gr. and L., derived from Greek through the Latin.

Jap., Japanese.

L., Latin (when indicating derivation).

L., Linnaeus (as authority for plant names).

L. anal., formed according to Latin analogy.

Loud., Loudon's *Encyclopedia of Plants*.

S., Skeat's *Etymological Dictionary*.

Wb., Webster's *Unabridged Dictionary*.

## NATURAL ORDER, CONIFERAE.

Cō-nif'-e-rae (L.) cō-ni-fers, i. e., cone-bearers.

## Suborder I.

Pī-nā-cē-ae (L. anal.) pine-like species.

## Tribe I.

Ab-i-ē-tin'-ē-ae (L. anal.) fir-like species.

## Genus I.

Pī-nus (L.) pine. The origin of this word is unknown. The meanings *mountain* or *rock tree* (Loud.) and *pitch-tree* (Sk.) have been suggested. See also Cent. Dict.

## Species 1.

Strō-bus (L.) the Latin name of a tree, probably coniferous, yielding an odoriferous gum. Gray gives the pronunciation Strē-bus, but apparently with insufficient reason.

## Species 2.

Taē-da (L.) a very resinous kind of pine often used by the Romans, especially for torches.

The popular name *Loblolly Pine* possibly has some connection with the *Loblolly tree* of the West Indies,—which is low, straggling, and thorny, and grows in neglected places.

The other common name, *Old Field Pine*, is obviously due to the fact that this tree is apt to spring up in any unoccupied ground.

## Species 3.

rig'-i-da (L.) stiff. [“of stiff habit,” Cent. Dict.]

## Species 4.

pun'-gēs (L.) pricking, prickly.

The name, *Table Mountain Pine*, is possibly derived from *Table Mountain*, S. C.,—the tree being abundant in that latitude.

## Species 5.

in'-ôps (L., poor, destitute), stunted, *scrubby*.  
Abundant in the barrens of New Jersey,  
—hence *Jersey Scrub Pine*.

## Species 6.

Bânks-i-â-na (L. anal.) *belonging to or associated with Banks*. Lambert, in giving our tree this name, probably wished to honor his cotemporary, the distinguished naturalist, Sir Joseph Banks. ["of an ashen color; sometimes a straggling bush," Cent. Dict.]—hence *Gray* or *Northern Scrub Pine*.

## Species 7.

mî-tis (L.) mild, soft,—perhaps with reference to the *slender* leaves and *weak* prickles.  
See G's description.

Called *Yellow Pine* on account of its *wood*.

## Species 8.

rês-i-nô sa (L.) resinous.

Called *Red pine* from its *bark*.

## Species 9.

pâ-lus'-tris (L.) marsh-growing.

The leaves are often *very long*,—hence *Long-leaved Pine*.

The name *Georgia Pine* needs no explanation.

The wood of this species is *reddish* rather than *yellow*. Possibly, it has been called *Yellow Pine* because of its resemblance in hardness, weight, and durability to *Pinus mitis*.

## Species 10.

pôn-der-ô-sa (L.) heavy.

var. scôp-û-lô-rum (L.) belonging to (i. e. growing on) the cliffs.

## Genus 2.

Pî-cē-a (L.) the ancient name for *Pinus silvestris*, L. The name is derived from the word meaning *pitch*.

The popular name, *Spruce*, is derived from *Prussia*, because the tree originally called *Spruce* was "first known as a native of Prussia." See Wb.

## Species 1.

nî-gra (L.) black.

## Species 2.

al'-ba (L.) white.

## Genus 3.

Tsù-ga (Jap.) "yew-leaved or evergreen," Cent. Dict.

N. B. The *t* and *s* at the beginning of this word must *both* be sounded.

## Species 1.

Cân-a-den'-sis (L. anal.) Canadian.

This specific name has been given to many plants first reported from the French possessions in North America, and is now generally to be understood as designating nothing more definite than a habitat in the northeastern part of the continent, whether in Canada or in the neighboring parts of the United States.

## Genus 4.

À-bi-ēs [s like z] (L.) the ancient name of a species of fir. Freund, in his Latin Lexicon, mentions an etymology referring to the *height* and *slenderness* of the trees.

*Fir* is an old Germanic word akin to L. *quercus*, oak. ["The original meaning was probably *hard* or *firm*" Sk.].

## Species 1.

bâl-sâ-mē-a (L.) of balsam,—or rather, *yielding* balsam.

For the names *Balsam* and *Balm-of-Gilead*, see Cent. Dict. under *balm* and *balsam*.

## Genus 5.

Lâ-rîx (Gr. and L.) the ancient name of the larch. The origin of the word *larix* is apparently unknown. Loudon suggests a Celtic word meaning *resin*.

## Species 1.

A-mēr-i-câ-na (L. anal.) American.

The names *Tamarack* and *Hackmatack* are evidently of Indian origin.

## Tribe II.

Tâx-ô-dî-ē-ae (Gr. and L. anal.) species akin to *Taxodium*.

## Genus 6.

Tâx-ô-di-um (Gr. and L. anal.) a genus resembling *Taxus* (the yew): though the resemblance is not striking,—consists chiefly in slowness of growth, and (occasionally) great age.

The name, *Bald Cypress*, is due of course to a supposed resemblance to the true cypresses, and to the fact that the leaves are deciduous.

*Cypress* is of Gr. and L. origin—the name of a tree. The meaning of the root is not known. It probably has no reference to the island of Cyprus, in spite of L's statement to that effect.

## Species 1.

dis'-tîch-um [ch like k] (Gr. and L.) consisting of two rows,—referring to the two-ranked leaves.

## Tribe III.

Cū-prēs-sin'-ē-ae (L. anal.) Cypress-like species.

For the name *Cypress*, see *Taxodium*.

## Genus 7.

Chām-ae-cyp'-a-ris [ch like k] (Gr.) ground-cypress. Why it was so called is not easy to understand. Possibly, the generic name was originally given to a prostrate species.

*Cedar* is a Gr. and L. tree name (*ce-drus*). It is now applied to several different genera and species.

## Species 1.

sphae-roid ē-a [oi as in oil] (Gr. and L. anal.) globular.

## Genus 8.

Thū-ya (Gr. and L.) "the ancient name of some resin-bearing evergreen." G. Loudon suggests its connection with the Gr. word meaning *to sacrifice*, its odoriferous gum making it suitable for incense.

*Ar'-bor Vi-tae* (L.) tree of life. L. says, "In Canada \*\*\*\* the wood is considered more *durable* than any other."

## Species 1.

ō-ci-dēn-tā-lis (L.) western,—applied to species of the Western Hemisphere,—the corresponding species of *Asia* being called ō-ri-ēn-tā-lis.

## Genus 9.

Jū-nip'-e-rus (L.) the Roman name. Its etymology according to Sk.—"young-producing, i. e. youth-renewing, from its evergreen appearance."

*Gin* (the beverage) is a corruption of *Juniperus*, through the *French*.

The etymology given in L. is not sanctioned by modern authorities.

## Species 1.

cōm-mū-nis (L.) common.

var. āl-pi-na (L.) belonging to the mountains.

## Species 2.

Sā-bi-na (L.) found on the Sabine (Sā-bīn) hills (north-east of Rome).

The Roman writers frequently speak of a certain plant used in sacrifices as *her-ba Sa-bi-na*, the Sabine plant. This was doubtless a *Juniper*. From the word *Sabina* has been derived the popular name in England, *Sab'-ine* (e silent) or (more commonly) *Sav'-in*. This latter name is sometimes applied in our own country to the next species, *J. Virginiana*.

var. prō-cum'-bēns (L.) prostrate.

## Species 3.

Vir-gīn-i-ā-na (L. anal.) Virginian.

This specific name is often applied to plants first reported from the English possessions on the Atlantic sea-board. It usually designates nothing more definite than a habitat in the eastern part of the United States.

This species is called *Red Cedar* on account of the color of the heart-wood.

For *Savin*, see under preceding species.

## Autumn Meeting of the New Jersey Forestry Association.

On the 8th and 9th of November a meeting of the New Jersey Forestry Association was held in Lakewood, Ocean County, N. J. Several prominent foresters were present from neighboring states—Colonel W. F. Fox, Superintendent State Forests of New York, B. E. Fernow, Chief of the Division of Forestry, Washington, D. C., Dr. Joseph T. Rothrock, Forestry Commissioner for Pennsylvania and Mr. Gifford Pinchot, of New York City. Others present were the Hon. Augustus W. Cutler and wife, H. I. Budd, State Road Commissioner, Hon. Franklin Dye, Secretary State Board of Agriculture, Judge George Wheeler, Mrs. A. B. S. Pond, Mrs. E. D. McCarthy, Dr. T. Price, Mr. H. I. Sabsovich and others, including several owners of large tracts of land near Lakewood.

Those who arrived on the morning train inspected the woods in the vicinity of Lakewood.

At the Laurel House from 7 to 8 p. m. a business meeting was held.

President Dye presided and Mr. J. Gifford acted as secretary. Minutes of the Trenton meeting were read and approved.

The new constitution was read and adopted. Copies will be mailed to the members of the Association as soon as it is printed.

Mr. H. I. Budd, Chairman of the Nominating Committee, reported as follows: For *President*, Hon. Augustus Cutler; for *Vice Presidents*, W. A. Stiles, Captain A. M. Bradshaw, Mrs. John C. S. Davis; for *Secretary and Treasurer*, John Gifford; for the *Executive Committee*, Franklin Dye, John Hall, L. B. Ward, and Miss Susan Lippincott.

The persons suggested by the committee were unanimously elected.

The meeting adjourned to listen to an instruc-



tive and interesting illustrated lecture by Dr. Joseph Rothrock, on the "Relation of Forests to the Surface of the Earth." He spoke of the effects of drifting sand, of the ravages of flood and fire, in short of the great service of the forest to mankind, not only in supplying many useful products but by lessening in many ways the destructive forces of nature.

The speaker was followed by Mr. B. E. Fernow, who spoke of forest fire and its prevention. He was the originator of the New York Fire Law which in a modified form is in operation in several other states. He remarked that fire could be reduced to a minimum, the same as crime, by constant vigilance and the construction of the proper kind of fire lanes. He emphasized the fact that the perfect organization of a force of State wardens knowing and exercising their powers and duties is the only practical way to prevent and extinguish fire.

Hon. Augustus Cutler spoke of the work in forestry already done in the State of New Jersey, and assured the association of his interest and support. Mr. Cutler is an active leader of forest reform in the State of New Jersey. For many years he has been patiently working for the betterment of the farm and forest lands of the State.

As early as 1879, while a member of Congress, in a speech on the bill declaring the Department of Agriculture one of the Executive Departments, Mr. Cutler said:

"Arboriculture has begun to attract the attention of the economist, for the wholesale destruction of forests and trees should receive the attention of Government, affecting as it does climate, rain-fall, etc., and it behooves us to commence now diffusing information upon this important subject before we shall have arrived at that point to which European governments have reached, and who are now, and for a long time have been, engaged in efforts to save from total destruction their timber and trees, and have appointed agents at the expense of the Government to protect them."

The following morning the party went by train to Chatsworth, in the heart of the pines. Teams were in waiting to convey the participants through the pine woods over an extremely sandy road to the "Plains," a remarkable region in South Jersey. The woods along the road consist mainly of pitch pine much damaged by fire. Soon a region, 15,000 acres in extent, was reached, where the growth, seldom

higher than one's waist, consists mainly of laurel and low pitch pines.

The following article in *Garden and Forest* was the result of Prof. Fernow's visit to these Plains:

"In connection with the annual meeting of the New Jersey Forestry Association on November 8th and 9th, a most interesting trip was made into the so-called Plains.

As the map in the Report on Forestry of the Geological Survey of New Jersey for 1894 shows, the whole region south of Lakewood in a belt of twenty-five to forty miles' width from the seashore is mostly forest of coniferous growth, the larger part Pines, which occupy the sandy plain. Within this extensive forest region, which in earlier times furnished considerable timber, then charcoal, and now mainly smoke during the fire season, there are found two areas comprising about 15,000 acres, which are separately known as the East Plains and the West Plains, although lying south and north of each other, separated by the east branch of the Wading River, and easily reached in a drive of a few hours from Shamong, now called Chatsworth, a station on the New Jersey Central Railroad.

The sandy Pine-barrens are covered with a growth of Pitch Pine (*Pinus rigida*), associated in the better situations with Two-leaved or Short-leaf Pine (*P. echinata*), the Jersey Scrub Pine (*P. Virginiana*), with Black Jack and occasionally Post Oak and other species of the Black Oak tribe. Here and there a Red Cedar occurs. and where a depression with impermeable subsoil gathers moisture enough, White Cedar swamps, with *Magnolia glauca* and Red Maple undergrowth and a few towering Pines, add interest to the landscape, and value, too, for the White Cedar is now undoubtedly the most valuable timber of the South Jersey forest, and the fruit of the Cranberry-bog, associated with it, the most valuable crop. Here gradually, there abruptly, we notice a change in the character of the tree-growth as we approach the region of the Plains.

This region is a sandy Pine-barren, just like the surrounding country—that is to say, it is an undulating plain of almost pure white sand with a poor growth of Pine; the visible difference between the plains and the surrounding country being mainly the more stunted appearance of the trees. But the great interest lies in the fact that here the student of forest-con-

ditions and tree growth can have the rare sight of a coppice of Pine, almost the entire growth being sprouts from the stumps of *Pinus rigida*—"She-Pin's," as the native calls this growth. Mr. John Gifford, who has explored this region for the Geological Survey of New Jersey, informs me that "the age of most second-growth shoots is about twelve years." This, of course, does not limit the age of sprouts, unless it be shown that after twelve years they succumb naturally and without the use of fire.

As is well known, conifers, as a rule, and especially Pines, do not sprout from the stump, or if they do the sprouts are usually not of long duration. But here we find this Pine not only a vigorous sprouter, and persistent, but that under conditions which would discourage any other tree from waging the uneven battle for existence.

Not only is the condition of the soil unfavorable, a very fine, although compact, sea sand, such as will support only a poor growth at best; not only is the subsoil more or less impenetrable, or else constituted of such coarse gravel as to predicate a droughty condition (by absence of capillary action), but fires are ravaging, if not yearly, at least at brief periods, this portion of the Pine country without mercy, and sooner or later the trees which have succeeded in establishing themselves and have escaped, perhaps, the fires of several seasons, are finally leveled again. Yet the roots do not give up the struggle, but send forth a large number of sprouts, which at present, two years after the last fire, cover the desolateness with a green bush-like growth, assisted by Scrub Oaks, Black Oaks and Laurel (*Kalmia latifolia*). Here and there a patch of trees has escaped the fire, stunted in form, but quite vigorous and bedecked with closed cones, although most of them with imperfect seed. Such trees, eight to twelve feet in height and four to five inches in diameter, may be twenty to thirty years old, or else more than one hundred, according to the ills to which they have been exposed. One old root which was pulled up, with a diameter of not more than five inches at the collar, showed two sprouts, both dead, each about two inches in diameter. These had evidently succeeded in weathering all ills for many years, the oldest eaten out by the fire, the younger counting eighty-three rings, pointing to an age of possibly 150 years for the root itself.

The gradual process of decadence was seen

in some of the older trees, the branches of which had been killed by the last fire, but from the trunk a dense crop of young twigs was produced by dormant buds, for which this species is noted; at the same time sprouts from the foot of the tree are thrown out. The next fire will probably kill the new growth and the life of the trunk, which, finally weakened at the base, topples over, while the root continues to sprout, again and again replacing the killed progeny, until it, too, is exhausted or a lucky accident allows one or more to develop into trees.

Much speculation has been indulged in as to the causes of the stunted growth. Tradition holds that there never existed a better growth. There was no time during the hurried trip to determine how far an impenetrable subsoil, which evidently exists here and there, gives rise to such growth, or else a gravelly substratum near the surface, which, while permitting the moisture to percolate, does not retain or pump it up by capillary action, and thereby produces a droughty condition of the upper strata. Nor could an estimate be formed, how far the repeated fires, added to unfavorable physical soil conditions, were chargeable. In one place a road appeared to have been able to prevent the spread of fire across, and as a consequence the "plains" condition was abruptly changed to the common "barrens" condition, with trees thirty to forty feet in height tolerably thrifty. This would indicate that after all, if the fires were kept out, normal, though poor, tree-growth could maintain itself.

That the tree-growth in the sandy Pine-barrens does not need to be so uncommonly unthrifty, provided acceptable conditions are maintained and fire kept out, was shown by the remnants of an abandoned nursery, where White Pines, Fir, Norway Spruce and European Larch had been allowed to grow up in the rows for thirty years and presented a grove of trees of quite acceptable sizes, heights of over forty feet and diameters up to eight and ten inches.

The subject of forest fires naturally formed the principal topic of discussion at the meetings of the Association, and it was agreed that the question of profitable use of these vast areas, either for tree-growth or for berries and sweet potatoes, could be deferred until the means for the reduction of fires were provided, which will be the main aim of the Association."

The meeting was probably one of the most

successful held by the Association since its organization at Riverton, May 12, 1894. All present seemed pleased and interested and favored a peripatetic meeting in North Jersey in the region of the Palisades next spring.

#### Plan and Purpose of the Philadelphia Commercial Museum.

The Philadelphia Economic and Commercial Museum is a municipal institution established by the city of Philadelphia.

The Museum consists of collections of natural products from all the countries of the world which have already entered our markets, or which may be made available for them, together with samples and cases of manufactured products from foreign countries, which may serve as aids to our manufacturers.

##### THE OBJECTS OF THE INSTITUTION.

1st. To bring before our manufacturers, dealers and consumers all the varied products of the world, that they may make the best selection for their own special interests.

2d. To publish all possible scientific and useful information concerning these products which may aid the manufacturer and consumer in his choice.

3d. To place on exhibition manufactured articles and samples, with full information from all markets which we ought to enter or control, and to furnish useful information concerning opportunities in foreign lands to our merchants and manufacturers.

The most important parts of the exhibits from Mexico, Central and South America, Australia, South Africa, and many Asiatic countries at the World's Columbian Exposition were, at its close, removed to Philadelphia. Similar products from all other countries have been secured, and are being rapidly added to the collections.

#### DIVISION OF EXHIBITS AND DEPARTMENTS.

##### I.

##### EXHIBITS ACCORDING TO COUNTRIES.

Under this classification a visitor may study the resources and commercial features of any particular country; can see the extent and variety of its products; investigate the character of its industries, climate and soil; means of transportation and manner of communication with the commercial world, and thereby be enabled to derive from the exhibits, maps, charts and other data collected, valuable information necessary in the conduct of his business.

##### II.

##### EXHIBITS ACCORDING TO KINDS OF PRODUCTS.

Under this classification the manufacturer, merchant or consumer interested in any particular commodity may here find systematically arranged and displayed samples of the various products which interest him, collected from all sections of the globe, with all obtainable data possible, whereby he may judge of their commercial value. For instance, the manufacturer of wood will have displayed for his benefit thousands of samples, embracing nearly all the woods of the world, in sufficient size and quantity, and with data necessary for him to determine their value in his particular industry. Likewise the textile manufacturer may here find samples of the wools, silks, cottons, vegetable fibres, etc., from every foreign country, comprising the most varied and complete collection of its kind in existence. The collections of hides, skins, leather, tanning materials, dyestuffs, food products, oils, medicinal drugs and herbs, minerals, etc., are intended to enable the dealer in these products to keep fully posted upon the constantly changing conditions of the markets of the world. These collections will be renewed or augmented as necessity may require.

##### III.

##### SAMPLES OF FOREIGN MANUFACTURES.

This will be a collection of samples of merchandise required in foreign countries, especially in the new markets of Spanish America, Australia, South Africa and other countries, the object being to show to the American manufacturer what his European competitor is doing in the foreign trade of these countries, and suggest to him new lines of goods which he may produce and sell with profit. Novelties and improvements made in European manufactures in standard goods and staples will be promptly reported. Detailed information as to the source, cost of production, selling prices, import duties, manner of packing, patent rights, etc., etc., will be furnished.

##### IV.

##### BUREAU OF INFORMATION.

Arrangements have been made with the Department of State at Washington for special reports on these subjects from consular officers in all parts of the world. The Museum will have correspondents in all foreign countries, men of experience, familiar with the conditions and peculiarities of their markets, who will forward regular reports concerning commercial possibil-

ities and the conditions of their particular localities, thus enabling the manufacturer and merchant to keep in close touch with the markets of the world.

Business directories and copies of important periodicals will be kept on file; also books of reference in all languages, statistical reports from all countries, and other publications bearing upon the question of trade.

Detailed information will be furnished manufacturers, upon inquiry, concerning commercial opportunities and the demand for specified products in any locality, together with the reports upon prices, duties, credits, etc.

Special effort will be made to procure early and complete information concerning the plans and specifications of proposed public improvements and private enterprises that may be open to contract.

#### V.

#### SCIENTIFIC AND EXPERIMENTAL DEPARTMENT.

In this department a careful study of the scientific and economic value of all products collected will be made. As for instance, tan barks will be carefully examined; woods will be studied; gums and resins will be tested. Many new vegetable fibres will be investigated with reference to new applications, and in general new articles will be subject to scientific investigation for the purpose of determining their commercial and practical value. Through the publications of this department, the institution will co-operate and exchange with all other scientific and educational museums of the world.

There is a ludicrous disproportion between the extent of the Government forest reservations and the number of special agents appointed to protect them. This is one of the most striking and interesting features of the annual report of the Secretary of the Interior. The forest reserves embrace 17,000,000 acres, the special agents number thirty. Their duty is to protect the timber, to examine stump lands and to investigate fraudulent land entries. In the circumstances it is obvious that the protection of the timber is a farce; with such a force there cannot be even a pretence of it. The importance of maintaining these forests is recognized by every intelligent person, and it is the duty of Congress to provide some means of guarding them adequately, as Mr. Smith suggests, either by the army or by foresters living on the reservation.—*New York Tribune.*

#### Forest Fires.

H. B. AVRES.

From the Minnesota Horticulturist.

Why the forestry question should be of interest to horticulturists may be a matter of wonder to some, as it once was with me, but we learn that their study of growing plants has enabled them to see in the forest things that the lumbermen have not seen, and this insight into the lives of the friendly trees has taught them, in their endeavor to clothe the prairie with productive crops, the use of trees. In common with other people, too, horticulturists acknowledge, I believe, some love of country and some regard for the future of the land that has nourished them.

It is not so strange, then, after all, that the farmers and gardeners, who have a permanent interest in their communities and in the State, should take an interest in and demand a better care of the forest, that, covering our highlands, precipitates the atmospheric moisture from the northeast and fills our hundred thousand natural reservoirs on the hills above us, from which are distributed through sandy strata a constant supply of pure water to the hundred thousand streams that have their sources on the lower slopes of the highlands.

But this is not the only way the forests bring water to us. Contrary to the pernicious theories propagated by some business men for business purposes, forests are not altogether dependent upon uncontrollable, climatic conditions for their existence; but many functions of the forest, especially its generous outpouring of moisture and temperate air, tend to form conditions favorable to its own growth and the growth of other plants beyond its borders. This principle is recognized by the most intelligent farmers and gardeners as well as by tree growers and foresters.

Together, then, let us move to aid our much abused forest in its strife with the prairie, even hoping that it may at last extend its moisture over all our State and neutralize the parching blight of our southwest winds (which last year were felt well toward the headwaters of the Mississippi); that it may roll them back and enlarge the bounds of our fertile and beautiful park region, until it may include even Martin county and continue on to give relief to the people of Nebraska and Kansas.

While the Forestry Association has been

busily cultivating a proper view of what should be done on the prairie and distributing information and trees for planting, our original forest has been and is being ravaged by and abandoned to fire.

To discuss the reason for this destruction will perhaps satisfy us of unwise policies in the disposition of the public lands, of fraudulent claims accepted, of dishonorable practices in stripping and abandoning lands, of connivances and sharp practices that many lumbermen smile at, of outright and traitorous thievery, of erroneous theories propagated for selfish purposes, of reports of wrong-doing ignored by officials, of silence by those who should have made wrongs known, of investigations that show conclusively that the lands with which our institutions have been endowed are being systematically robbed, of reform that is plainly needed in this line, and not only reform but intelligent, systematic management, which, I trust, this association will take active and vigorous measures to secure.

The whole broad subject needs immediate attention. But I must confine myself to the special subject of this paper, which is:

#### THE PREVENTION OF FOREST FIRES.

What is the use of all this talk about forestry and the prevention of fire? What does it amount to? It is all very nice to have some subject that sounds well, that sounds patriotic, but what good does it do?

Such ideas, if not spoken, seem to have been implied by the attitude of too many people towards the Forestry Association and towards the forestry work; but we are glad to say this quizzical and indifferent attitude cannot now be assumed without downright ignorance and culpable inattention to the needs of the day.

The time has passed for doubting whether forests are beneficial and should be preserved and propagated.

Even the quieting remarks made at our meeting a year ago are far behind the times to-day, for, sitting in the ashes of our recent fires, the people are crying: "The calamity howlers were right, but they did not tell us half of what was going to happen. We are now ready for the plain facts. Can't you help us?"

May we not then at once discuss these questions?

First—Should our forests be protected from fire?

Second—Can it be done?

Third—If it can be done, how?

Our forest furnishes employment to 20,000 men cutting pine and perhaps a third more cutting fuel, ties, piles, poles, posts, barrel stock and hardwood. Is it desirable to perpetuate this great industry and not only produce enough material to supply our own wants, but to bring money from other States and other nations by shipping our surplus to them as we do now? There can be only one answer to this question. But what has this to do with fires? Simply this: The forest cannot be preserved unless the fires are stopped, and if the fires be stopped the timber will grow again. Some deny the latter part of this statement, and say after the virgin pine is cut, pine will never come in again, and the forest is worthless. This is too true under the present liability to fire, but utterly and perniciously false if the fires be prevented. Even men of intelligence and prominence in the lumber business have said: "Why prevent fire? Pine will never come in again after the marketable timber is once cut." This assertion needs the strongest possible denial. The men that make such an assertion deserve ridicule, and I will say they must have had sawlogs in their eyes when they travelled through the woods. This is not altogether a joke; they were looking for saw logs and could not have looked at much else; for loggers in cutting often leave a hundred thrifty and vigorous young pines from four to ten inches in diameter, and from twenty to a hundred feet high on an acre after the log timber is cut, and on pine stump land that has escaped fire three years, thousands of little pine seedlings may be seen springing up.

In order to be able to refute such misstatements utterly, I have here minutes of the exact location where young pines in excellent condition for timber grown may be seen, and right by may be seen burnt land cut the same year that could not be put in a condition as promising for timber for less than twenty dollars an acre. In fact, so favorable a soil, mulch and shade can hardly be made at once on the burnt land for any price. Several such acres on 16—56—23 were staked off and the trees counted; on which thirty-two thousand feet had been cut three years before, were thirty-two thrifty sapling white pine, 8 to 11 inches in diameter and 30 to 80 feet high; ten poplar 8 to 14 inches in diameter and 60 feet high; 1600 poplar sprouts  $\frac{1}{2}$  to 1 inch in diameter and 5 to 12 feet high; a light underbrush of hazel and vine maple;



and under all this were 1267 little white pine seedlings two years old and 4 to 8 inches high. Another acre on the same section has 200 trees of white and Norway pine averaging 8 inches in diameter and 45 feet high. Are not these worth saving? Many thousand acres of just such trees have been burned on land that is not in demand for farming at any price. Should such trees be saved? No one dare say not.

On account of the fires and conditions unfavorable to tillage, much of such land has no market value. Just what it would have if safe from fire is a subject that should have careful study.

The fires also damage property having a present market value, such as standing and other log-timber, camps, camp equipage and live stock, mills located in the woods and lumber, besides the homes and lives of our fellowmen. Excepting the latter, there is no loss that compares with the prevention of the future growth of the forest with its products and its beneficent influences. There may be many who have some doubts as to what the favorable influences of the forest are. Here are a few that are reasonably certain:

1. Aiding the damp northeast winds in their conflict with the parching winds from the southwest.
2. Preventing deep freezing of the soil.
3. Catching the snow by checking the wind during blizzards.
4. Holding snow in spring by their shade.
5. Preventing erosion of the soil.
6. Giving out moisture into the air.
7. By their moisture, their coolness and their resistance to winds, promoting rain fall.
8. By promoting fogs, often preventing frosts.
9. Protecting against the cold winds of winter and the hot winds of summer.
10. Promoting health by purifying the air and the water. (Here let me say that in the regions burned last season we already have premonitions of fevers, and there are many cases of sickening by the use of water leached through ashes and deprived of shade and growing plants).
11. Regulating water flow. (If the rains next spring be as heavy as last, we may note a much higher stage of water; for the large denuded areas will shed their waters quickly).

In short, the good influences of the forest are many, and together they are cumulative. It is not within the province of this paper to enlarge

upon them; they have been discussed time and again and nearly always with the same conclusion. The nations of Europe have long ago taken effective action. Our Federal Government and the Eastern States are regretting that they did not do something before the land was patented to individuals.

Pardon me if I repeat that one of the first things to be done for the preservation of the forest is to stop the fires. Our present liability to fire absolutely prevents any hopes of successful forestry. After cutting, a forest will soon grow again; after fire it will not. Certainly these fires should be stopped and at once.

Can they be? is the next question.

The fire as it raged at Hinckley could not; but each of the hundreds of little fires that contributed to it could have been: Prevention, rather than cure, should be sought, and as fires always have a small beginning and are in every instance caused by man, they can, with very few exceptions indeed, be kept within control. According to Dr. Fernow's report for the year 1893, the forest fires in Prussia during the exceptionally dry year of 1892 ran over only 6-100 of one per cent. of the Prussian forest area. There they protect against fires.

We should have statistics of the areas burned over in Minnesota during the past season. Lacking such we must use what rough estimates we can get. I am told by a man who has been through the region, that within the triangle between Staples, Grantsburg and Duluth 90 per cent. of the land was burned over. My own observation covers roughly the country between the Mississippi and the St. Louis rivers and the Prairie river basin above Grand Rapids. I think 75 per cent. of that land has been burned over; and from what can be learned of other parts of the forest, probably 40 per cent. of the whole wooded portion of Minnesota was burned over last year. If we assume this 40 per cent., or 1 in  $2\frac{1}{2}$  acres, as approximately correct, and compare this percentage as the result of no systematic protection in Minnesota with the 6-100 of one per cent., or 1 in 10,000 acres, burned over in Prussia, where there is protection, during one of the driest years, are we not assured that something can be done?

Others have prevented fires, cannot we? Will the people of Minnesota, pioneers nearly every one, and with a record to be proud of in every other work, lag so far behind in this? I think not if they will only give their attention to it.

It seems to me it all hinges on this point—attention, for if this subject be studied as it should, every one will feel it his duty to stop the fires.

How can this be done?

Let me give my experience of last summer: Passing land of a friend and seeing that fires were burning on it, I stopped to put them out. Five or more had been started wilfully; one had gone out, but four were burning vigorously, both eating into the turf and running over the surface. With mattock and shovel the fire was put out within a week, by digging shallow ditches through the dry turf. Fires can be put out even after they have gained considerable headway; but the easiest and best way to stop a fire is to prevent it starting; and to prevent them all, all the people must be reached and influenced. How to reach them must be left to the managers of such an undertaking; but a few suggestions briefly can be made here.

Every individual should have some influence brought to bear upon him that will prevent him letting fire get beyond his control, whether he be locomotive engineer or trackman, farmer or tramp, lumberman or lumber thief, sportsman or pot hunter, white man or red. The aim must be to prevent wild fires entirely. Legislation is talked of and is necessary; but it should be remembered that legislation can at best only support a movement. Penalties are not enforced unless the people enforce them. Officers cannot be everywhere, and officers may fail to do their duty unless the people urge them on. There must be a strong popular sentiment in favor of the work. You ask how can this sentiment be created? My answer may surprise you, but I think I can say it safely—we have this sentiment already.

The friends of the forest might be congratulated on this, but for the fearful price we paid for it.

Yes, I believe every one interested in the woods is anxious that something be done to make life and property there more safe, but they have different ideas of what should be done. If we could only select those measures on which all agree, we would not be far from right if all were well informed on the subject.

The greatest difficulty, perhaps, lies in the fact that often the restriction men would like to have placed on their neighbors is what they do not like to have tried upon themselves. It is too often irksome, when living miles away from

neighbors and no one there to see us, to make any sacrifice for the public good. Settlers clearing land want to set fire when and where they please. Hunters and other campers want to build fires where they will be most convenient. Children, some of them gray headed, like to start a fire wherever it will make a big blaze. Railroad companies do not like the expense of careful guarding, and locomotive firemen (it is hard to blame the poor fellows) like to have a good strong draft and are tempted to take out screens and traps. Section foremen have so few men to help them that they cannot keep the right of way clear and have not time to watch the piles of rubbish they burn and see that no fire escapes.

Considering all the sources of fire, it is evident that there is much ignorance and there are many errors of judgment as to when a fire is liable to spread. There is also much wilful and deliberate setting of fire when it is intended to spread.

The work of prevention will have to be done by those who have intelligence and love of country and who see friends in the trees that are devoting their lives to the service of men. The ignorant must be kindly instructed, the vicious must be compelled to use caution.

#### PRACTICAL ACTION.

But how can every one be reached? Let us not say it is impossible! That is the lazy man's doctrine and is entirely unlike Minnesota people. It can be done, *and done well*, if every one will do his duty. There are now lines of communication established for every family and every individual. Use these. There are now established supervisors of organized townships. Use these. There are now established schools for the instruction of every child, who may in turn instruct every family. Use these. There are now established constables and other police officers. Use these. There are now offices of justice in every township. Use these.

Will the present organization be effective, and can this be added to their duties and without increase of salary? Try it and see. But from what source shall emanate the instruction and discipline necessary, or, rather, who will represent the people in this function? Every efficient system must have a head. A man specially qualified for the position should have control of it, and he should have ample means to carry out his plans. He should not be obliged to work at anything else, for it will require all

the time and all the energy of the best man that can be found. He should be empowered to employ counsel and assistance, especially to collect and distribute information; and he should be thoroughly supported by necessary legislation.

To begin at once to establish every known valuable feature of forestry would be very imprudent and would involve much needless expense. On the other hand, a miserly policy would be quite as bad, for the expense would be even greater through loss of the forest. Let everything be done consistently, with a reason for every act, a sound footing for every step, and above all, with a love for "Our Minnie," her people and her trees.

This last clause is sentimental, but sentiment is just what we need. If there had been the proper sentiment on this question forty years ago, our forest resources would have been safe. But now as we pass among the charred remains of the grand old forest that once stood as a guaranty of our prosperity, those prophetic words of Scott applied to Marmion are suggested:

"Where shall the traitor rest?  
He, the deceiver,  
Who could win woman's breast,  
Ruin, and leave her?"

It is the duty of those who have been enriched by harvesting foreign timber to at least leave the forests not wanted immediately for farming in fair condition to produce a new crop, and not leave them as they do now, blighted and worthless.

The *Scientific American* recommends the following treatment for destroying stumps of trees:—"In the autumn bore a hole in the centre of the stump about eighteen inches deep, and one to one and a half inches in diameter. Put in about two ounces of saltpetre and fill the hole with water and plug it. In the following spring take out the plug, pour in eight or ten ounces of kerosene, ignite, and the stump will smoulder, but not blaze, to the extremities of the roots, leaving only ashes."

Shingles are replacing weatherboards. They are handled more easily and there is less waste in their manufacture. They form a perfect shelter and outlast weatherboards of the same wood owing to the fact that the water falls with the grain.

#### Correspondence.

FREDERICA, DEL., NOV. 12, 1895.

Hon. Augustus W. Culler, Morristown, N. J.

DEAR SIR—Being interested in Forestry, I noticed an article in one of the Philadelphia papers relating to the meeting of the New Jersey Forestry Association in Lakewood. If the meeting had been a prize fight, base-ball game, horse race, or wedding of some millionaire's daughter to a foreign nabob, a whole page would have been devoted to it.

It occurred to me that my experience in forestry might help to induce young men to engage in tree planting with a reasonable hope of financial gain in their lifetime.

One reason, and perhaps the principal reason, why more people do not engage in forestry, is that they must wait so long for the profit. There are few of us who are not more or less selfish, and but few who care for the welfare of posterity. In giving my experience it may appear to some that I am blowing my own horn, but I hope I am actuated by a nobler principle. I have desired to leave this world better for having lived in it. All sane men would rather be classed with benefactors than malefactors.

Having said this much by way of introduction, I shall proceed to give my experience in this line.

I bought a farm near this place in 1839, and in 1840 planted chestnut, walnut and pine trees on about eight acres. I was then in my thirty-fourth year, and have been cutting the timber for fuel and saw logs for over twenty-five years. The first growth of pine and chestnut have been mostly cut, but I have chestnuts still standing of my own planting that measure *nine feet and six inches in circumference at the butt and six feet in circumference thirty feet from the ground*, making three saw logs each fifteen feet in length. I would still have some of my first growth of pine had I not allowed a friend to cut them for piling some years ago. He said that he could not find others tall enough to fill his order. I think they were eighty feet in length. At any rate, I have some second growth pine, which came from seed of the first growth, that are seventy-five feet high.

Perhaps I have said enough to interest you in the subject, and as my bare word may not have weight with those who do not know me, I suggest that you come or send a representative to see my forest.

Respectfully,

T. B. COURSEY.

**Peculiarities of the Tropical Forest. A Review  
of Haberlandt's "Tropenreise."**

BY ERWIN F. SMITH.

From Science.

In recent years the botanical garden at Buitenzorg, Java, has become a sort of Mecca for European botanists. Solms-Laubach, Schimper, Goebel, and many others have there studied tropical vegetation. Probably no other botanical garden in the tropics offers as good facilities for study, and certainly no other is so well-equipped, has been used as extensively or has been productive of anything like as much good work.

One of the results of a sojourn at Buitenzorg is a book of 300 pp. by Dr. Haberlandt ("Eine Botanische Tropenreise") giving travel sketches and graphic accounts of the Indo-Malaysian vegetation. The author has not confined himself to dry dissertations, but has had his eyes open to the biological side of botany, has known how wisely to omit, and has mixed in enough general observations and human interest to make a readable book and one of considerable general interest, even without the useful illustrations of characteristic vegetation, reproduced from pencil drawings. To describe all the interesting things in this book would be nearly equivalent to translating it. It must suffice, therefore, to call attention to some of the leading features. The book begins with the departure from Trieste; gives a chapter or two on the outward voyage, including some account of Bombay; describes the garden at Buitenzorg; discusses its climate and devotes a chapter to each of the following topics: The tree of the tropics, tropical foliage, flowers and fruits of the tropics, lianas, epiphytes, tropical ant-plants, the primeval forest, the mangroves, etc. The reader will also find fresh and interesting notes on a variety of cultivated plants,—tea, coffee, rice, cocoa-nut, cinnamon, cinchona, banana, etc. Various excursions into the island are described, and one chapter is devoted to the animals of Java and another to the inhabitants,—their language, customs, amusements, etc. On the return journey Dr. Haberlandt spent a few days in Ceylon and finally crossed the Arabian desert in Egypt, already classic ground by reason of the admirable researches of George Volken on the adaptations of the desert flora.

Not least attractive is the poetic and artistic

feeling and the strong personal element that pervades the book. The following are some of the things that attracted special attention: The extent to which variegated leaved plants have been substituted for flowers in tropical landscape gardening; the broken contour of the forest, certain species towering far above the rest and noticeable at a long distance; the general whiteness of the tree trunks; the preponderance of woody growths; the form of branching, in many cases quite unlike that of European trees; the very rapid pushing of the leafy shoots which hang down, pale or reddish, weak and limp, until they have reached full size and then gradually become green, erect and self-supporting; the nearly uniform absence of periodicity in leaf fall; the marked tendency of the foliage to be entire, smooth and coriaceous, to which is often added a lacquer-like lustre; the dazzling reflected light of tropical foliage, in striking contrast with the mild transmitted light of European foliage; the numerous modifications of leaves and changes of position to avoid very intense light; the enormous assimilative power of individual leaves and the comparatively small number on a tree; the excessive brightness of the sky and the great amount of light in the interior of a tropical forest, the shade being not nearly so dense as in an European beech wood; the enormous vegetative activity, the sharp struggle for light, and the occupancy in the forest of every available foot of space, an almost impenetrable thicket on the ground, epiphytes and lianas on the trunks of trees in great profusion lifted up out of the surface tangle, and individual trees reaching the necessary light by expanding their tops above the rest of the forest; the general lack of protective adaptations against cold, so that one comes to understand the full meaning of many northern modifications only after he has studied the tropical vegetation; the very rapid growth (in young trees frequently as much as five metres a year), which takes place in an atmosphere so moist that transpiration is greatly diminished or at times stopped altogether, and which goes to show that there is no necessary connection between the transpiration stream and the upward movement of plant foods from the roots, osmotic action being sufficient to bring it about; the noticeable absence of palms from the forest; the curious adaptations to conserve moisture, roots within pitchers, etc.; the occurrence of breathing roots in the swamp plants, *Sonner-*

alia and *Avicennia*, and of bracing roots in many trees, in *Sterculia* enormously developed; the numerous extra functions of tropical roots, most striking of all "the change of the aerial roots of various *Orchideae* into green, ribbon-shaped organs of assimilation" (*Taniophyllum Zollingeri* has no other); the preponderance of bright colors in tropical flowers (white, yellow, orange, and bright red) and the rarity of blue flowers; and, finally, the many leaves, stems, etc., in which a particular form seems to be of no value to the plant but has been retained because not harmful, the hypothesis being put forward that many of these forms, not all, are mere "Luxus Anpassungen," due to the internal energy of the plant, and are not modifications brought about by external agencies, such as food and climatic changes, the author pointing out that the multiplicity of these variations is greatest in the places where, according to the Darwinian law, they should be least, viz., in the tropics, where the climate varies but little,—"Zwecklose Blattgestalten und ebensolche Verzweigungsformen, phantastisch sinnlose Blumenmodelle und tausend anderer morphologische Eigenschaften, die nutzlos sind, bleiben erhalten weil ihre Ausmerzungen kein unbedingtes Erforderniss für der Fortexistenz der betreffenden Pflanzen war."

This is a volume to go on the shelf with Schimper and Goebel, but not until it has been read and enjoyed from cover to cover.

Forestry Commissioner Rothrock finds that the direct loss by forest fires in this State last year was in round figures \$1,000,000. That seems a pretty large sum to pay for the carelessness or malice of the people who started the fires, but it dwindles into insignificance beside the statement that the prevention of such fires for a period of forty years, or long enough to let the saplings grow into timber trees, would add \$1,200,000,000 to the forest wealth of the State. Add to this the part played by forests in regulating the rainfall and checking the severity of alternate floods and droughts and the enriching of the land itself by their decaying leaves, and the economic loss by forest fires rises to stupendous figures. Some day, perhaps, public sentiment will be educated up to the point where it will operate to prevent such reckless waste, but the process of its education is as slow as the growth of an oak, while the incendiary's match acts as quickly and easily as the acorn drops.—*Philadelphia Ledger*.

### The Palisades.

From the New York Tribune.

Among the natural beauties of this country one of the foremost is the great wall of rock which forms the west shore of the Hudson River from Edgewater, nearly opposite General Grant's tomb, to Piermont, a distance of about fifteen miles, and which is known as the Palisades.

At Edgewater the bluff is not directly on the river front, but at Fort Lee and for miles north the rocks abut directly on the water, in the shape of a perpendicular cliff, which, if it were in Colorado or Nevada, would be known as a canyon. The cliff varies in height from 200 to 550 feet, and is fringed at the base by a slope of fragments of broken rock, covered with a dense growth of foliage, except where it has been stripped for the purpose of breaking away the stone, by vandals who are more deeply interested in the commercial value of the rock than in the magnificent picture which the cliff presents.

This wood-covered slope which forms the base for the great columnar cliff is known as the talus, and geologists as well as lovers of the beautiful agree in saying that its preservation is essential to the maintenance of the cliff.

The Palisades are formed of basalt or trap, an igneous rock which is of volcanic origin. They were formed, geologists contend, by bursting up in a semi-molten condition through the layers of sandstone which formed the bottom of the primeval seas. The sandstone, which formed a cover for the volcanic mass and pressed it into form, was ground away by time and by the action of the great glaciers which, in the ice period, came from the northwest and scoured the summit of the range now known as the Palisades. There are some other instances of this formation elsewhere in this country and in other parts of the world, one of the most notable being the Giant's Causeway, on the Irish coast. There are trap cliffs in this country in the far West and in Connecticut, but nowhere on the face of the globe is there an example of twelve miles of vertical cliffs of basalt of 300 to 550 feet high on the banks of a mighty river and within easy access of 4,000,000 people. It is not only an object lesson in geology, but a picture of magnificent grandeur, which has withstood the storms and tempests of thousands of years, and which remained undisturbed through the centuries until about fifty years



ago, when matter-of-fact men, who were not awed by the majesty of the creation, began to mutilate the cliffs for material gain.

The castle-crowned and terraced Rhine, the beautiful blue Danube, the Thames with its modern embankments and the Seine with its artistic bridges, all have their attractive features, but none has a shore line direct from the hand of the Divine Architect, and to which man can do nothing by way of improvement, like that formed by the Palisades.

And this is the creation which, unless active steps are taken to prevent, will soon be mutilated beyond redemption. It was put to base uses for years as a background for advertising signs, but the desecration to which it is now being subjected is even more serious. The first to break away stone from the cliff were the owners of sailing vessels, who brought large cargoes to this country, but had no American products to take back. They took their ships up the Hudson River and ballasted them with rock from the Palisades. Then came the trap block pavement people, who were attracted to the Palisades by the superiority of the stone and the ready means for transportation. But the improvements in explosives and in stone-crushing machinery and the growing demand for broken stone of great durability, for concrete and for macadamizing roads, made the attacks on the Palisades more vigorous, and their mutilation for commercial gain made rapid strides. Several plants have been established between Fort Lee and Piermont which are devoted to the stripping of the slope and demolition of the cliffs. The operations of these stone-breaking plants are not only destroying the beauty of the cliffs and defacing the scenery, but they are the source of much annoyance to the people on both sides of the river, but particularly to those on the east shore, between New York and Tarrytown. Blasting goes on continually, and with every discharge of dynamite a part of the wall or its lower framework is torn away, and the muffled sound of the explosion and the tumbling of the rocks made mournful echoes along the cliffs and across the trembling water.

Carpenters in laying a floor ought bear in mind that to every board there is a right and a wrong side. With the sap side up there is less danger from splinters.

The sacred books of the Buddhist prove that, in the early days of their religion, a question which deeply agitated the minds of the learned was whether or not the trees had souls. The controversy raged strongly, for the belief was widespread that, in injuring or mutilating a tree, proportionate pain was inflicted on its Spirit's nature.

Orthodox Buddhism decided that *dewas* or spirits did dwell in trees, but that the trees themselves had neither soul, mind nor sentient principle.

But no such question need have been discussed had there not been a strong inherited belief in the same; and in the study of the primitive Aryan races we find that the doctrine of the spiritual life and death of a tree was bound up with their history.

The tree worship of African tribes at the present day is inherited faith from primitive man, and the savage of the nineteenth century affords us an excellent example of the effect of our Christian civilization and racial development. He is our antipodes.

The same idea creeps out again and again in Greek and Roman mythology, and the folk lore of every country and people in Europe is full of it, and at such seasons as Christmas these primitive customs are actually practiced.

The numerous German and English songs and offerings to the apple trees are still heard and seen on every Christmas. Ovid in his *Metamorphoses* tells the beautiful story of Erisichthon's impious attack on the grove of Ceres, and how the Greek dryads and hamadryads had their lives linked to a tree, and as "this withers and dies they themselves fall away and cease to be; any injury to bough or twig is felt as a wound, and a wholesale hewing down puts an end to them at once—a cry of anguish escapes them when the cruel axe comes near."

It was this established belief that produced such lines as:

"Loud through the air resounds the woodman's stroke,  
When, lo! a voice breaks from the groaning oak,  
Spare, spare my life! a trembling virgin spare!  
Oh! listen to the Hamadryad's prayer!  
No longer let that fearful axe resound;  
Preserve the tree to which my life is bound.  
See, from the bark my blood in torrents flows;  
I faint, I sink, I perish from your blows."

—Ledger.

Dried rubbish exposed to the heat of the sun's rays has been seen to catch fire under circumstances that rendered any other cause impossible.—*Northeastern Lumberman.*

### A Fire-Resisting Tree.

An interesting account of a fire resisting tree is given by Mr. Robt. Thomson in a consular report on Colombia. He writes: The thousands of square miles of natural pasturage on the plains and lower hills of Tolima assume during the rainy season the most beautiful verdure. But in the alternate season of drought the general aspect is that of a desert. These lands were originally acquired at a nominal cost. No conservation of the natural fertility of the land has ever been taken into consideration. On the contrary, the natural grasses, intermixed with scrub or brushwood, have been systematically burned from year to year, and the burnings effected during the most scorching periods of drought. The principal object attained by this process of despoilation is the reproduction of new and tender herbage or pasturage, which, with the advent of the rainy season, forthwith covers the parched surface. Vast pastoral regions—scores of thousands of square miles—in tropical America, are thus maintained. Half a century, or it may be a century, of this treatment suffices to extinguish almost every trace of fertility in the soil. In Tolima alone hardly less than 2,000 square miles of savannahs and hills, ascending to some 3,000 feet, have in this way been transformed into comparatively barren wastes. And in other parts of the Republic many thousands of square miles have similarly lapsed by this devastating process.

This persistent burning of the savannahs and hills for crops of renewed pasturage plays desperate havoc with all other vegetation, trees and brushwood. Isolated palm trees, with their intensely hard trunks and endogenous structure, together with groups of brushwood in sheltered or humid spots, sometimes withstand the fury of the flames. There is, however, one phenomenal exception to this subversive power of the fires. A humble tree with contorted and rugged trunks and branches and scabrous leaves, a tree presenting the most subdued and weird aspect conceivable; this pigmy tree not only resists the fury of the flames, but fire is actually congenial and subservient to its existence, for the tree, instigated by the conflagrations, forms itself into great plantations. The name of this tree is chaparro (*Rhopala abovata*), indigenous to Colombia and other South American countries. It attains a height of from 15 to 20 feet, and its distorted trunks measure from 9 to 12 inches in diameter. It is widely

distributed in Colombia, for I have found it at the Sierra Nevada of Santa Marta and dispersed inland 1,000 miles from the sea. In contact with great forest fires it maintains a precarious existence. But, as already explained, it usurps dominion in places where no other tree can grow. In Tolima it abounds on the slopes and ridges of the hills at elevations from 1,000 to 3,500 feet. In this department alone hundreds of square miles of the lower hills which have been reduced to sterility by incessant burning are occupied by this diminutive tree, and it assumes the aspect of vast systematically formed and well-kept plantations. This is more than a triumph of the "survival of the fittest." It is very remarkable that these fire-begotten plantations are nowhere crowded to excess; on the contrary the trees are so regularly placed that their aspect vies with that of the most carefully formed plantations. There is a popular belief in Tolima, where alluvial gold abounds, that this tree flourishes only on those seductive lands, serving as a guide to searchers after the precious metal.

### Mental Geography.

From the Chicago Times-Herald.

The most populous country is Olympia. Many go there; few return.

The largest river is Time.

The deepest ocean is Death.

The region where no living thing hath habitation is called Yesterday.

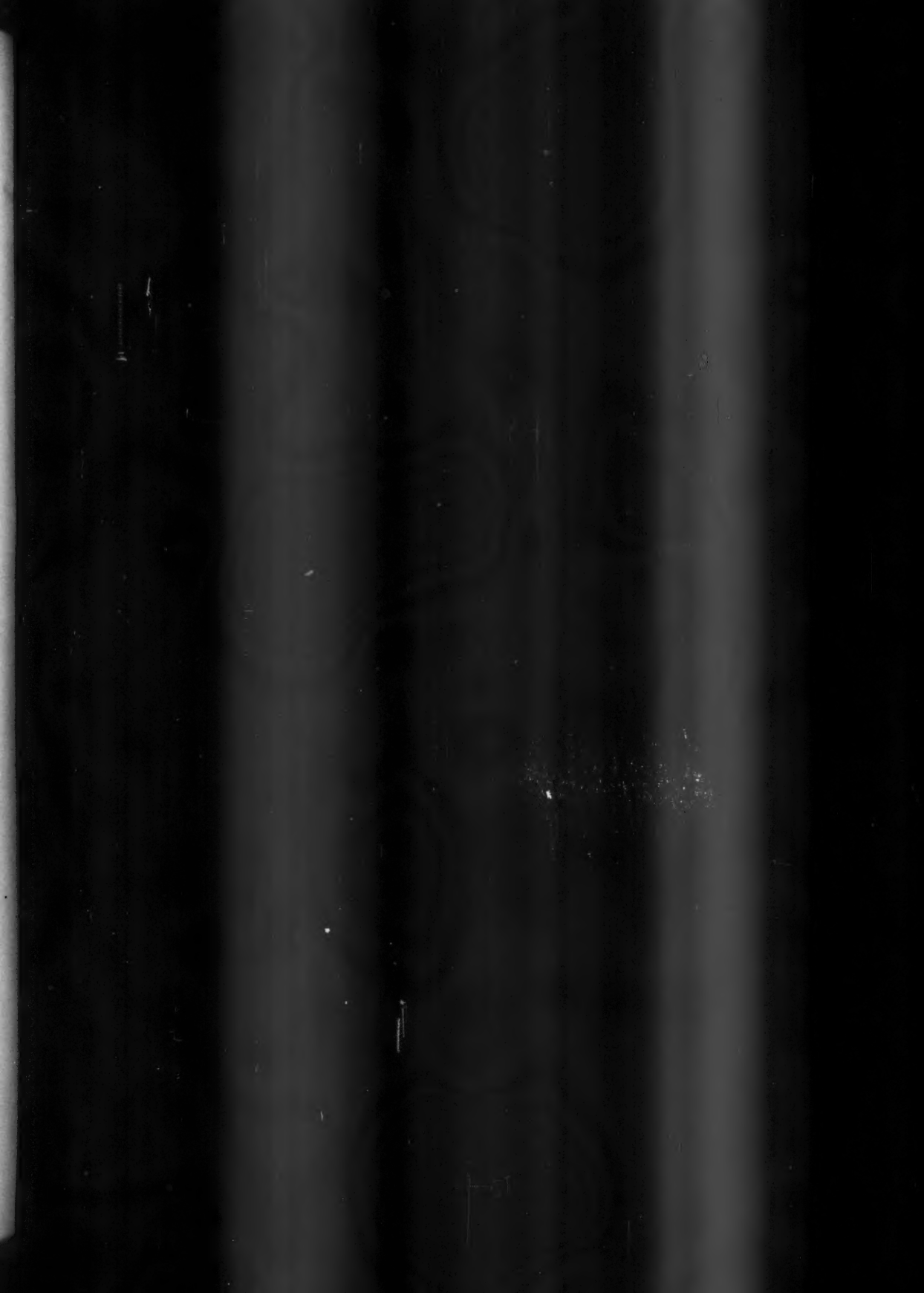
The most highly civilized country is To-day.

The highest mountain is called Success. Few reach the top save those who watch sharply for the passing of the spirit of the mountain, Opportunity, who carries upward all those that seize hold upon him.

The region where no man hath ever set foot is called To-morrow.

The greatest desert is called Life, and it hath many oases. These are called Hope, and Ambition, and Love, and Charity, and Home. And of them all the last is the most beautiful. Besides these are many others, smaller in extent, whence the traveller obtaineth refreshment during the weary journey through Life.

THERE are two good pamphlets which may be had for the asking, and which every lumberman and farmer should read and study: "What is Forestry?" and "Forestry for Farmers," by B. E. Fernow, Chief of the Division of Forestry, Washington, D. C.





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